

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2005/000257

International filing date (day/month/year)  
26.01.2005

Priority date (day/month/year)  
28.01.2004

International Patent Classification (IPC) or both national classification and IPC  
C09C1/36, C09C1/04, C01G23/00, C01G9/00, A01N25/22, A61K7/42

Applicant  
OXONICA, LTD

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☐ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Authorized Officer

Siebel, E

Telephone No. +31 70 340-1016



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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Reference is made to the following documents:

D1: DE 25 45 243 A  
D2: WO 0140114 A  
D3: WO 9960994 A  
D4: WO 2004105487 A

1. The application does not meet the requirements of Article 6 PCT, because claims 39-40 are not clear. The terms "light-sensitive physical feature" and "physical factor" used in claims 39 and 40 respectively are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.
2. Document D1 discloses a titania which has been doped with Cu, Mn, V, Nb, Ta, Mo, W, Sb. The doping is done in such a way, that a concentration gradient is obtained. The concentration of the dopant on the surface is higher than in the core. The process (absorption process) comprises the steps of suspending titania(rutile) particles in water, adding an aqueous solution of the first dopant (Nb(V)), collecting the precipitate, washing and drying the obtained product at 80 to 150°C. the obtained dry product is suspended in water, an aqueous solution containing vanadium is added, a precipitate is obtained. After collecting and washing the obtained precipitate, the product is predried at 80°C, then heat treated at 150°C for several hours and afterwards calcined in air at 600°C. This procedure leads to inhomogeneously doped rutile, with a concentration gradient of V and Nb. Due to the dopant, the defect electrons generated by irradiation of titania with UV light are neutralized within said titania particles and degradation of the composition comprising said doped titania is avoided (see D1, page 7, line 10 to page 8, line 29; page 9, line 1 to line 14; page 11, line 1 to line 25; examples 1,2).
- 2.1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1-7 is not new in the sense of Article 33(2) PCT.
3. Document D2 discloses a particle (TiO<sub>2</sub>) with a host lattice and a dopant ((Nb, V, Sb, Ta, Sr, Ca, Mg, Ba, Mo; Si), which is capable of absorbing UV-light. The particles are produced either by coprecipitation or by an adsorption process. In case of an adsorption process, TiO<sub>2</sub>-particles and ammonium vanadate (dopant) are mixed in

deionized water. The mixture is sonificated for 10 minutes and then boiled to dry. The material produced is then fired at 700 °C for 3h to give 1% vanadium doped TiO<sub>2</sub>. In case of a coprecipitation process the dopant (as ammonium vanadate) is added in the right amount to a solution of HCl(conc.), water and Isopropanol. To this solution is added dropwise titanium isopropoxide, under vigorous stirring. The solution is then slowly heated to 50 °C until precipitation begins. The temperature of 50 °C is kept until the precipitate has settled (3-4h). The material is removed and allowed to settle for 12h. The particles may be coated with oxides of elements like Al, Zr, Si. The particles may also be coated with one or more organic materials. (See D2, page 2, line 19-25; page 3, line 1 to line 20; page 4, line 2 to page 5, line 8; page 5, line 17 to page 6, line 17; examples 1, 2, 3). The use of these particles in sun-screen compositions, paints etc. is also disclosed.

The methods (adsorption, coprecipitation) of making said particles appears to be the same, therefore it is assumed, that the obtained particles will be the same as those of claim 1.

3.1. The subject-matter of claims 1-52 is not new in the sense of Art. 33(2) PCT.

4. Document D3 discloses a process to produce nanosized doped titanium dioxide. A suspension of TiO<sub>2</sub> is placed in contact with a solution of the dopant (Mn(II)) and the resultant solution is sonificated and boiled to dry. The material produced is fired at 700 °C for 3h to give 1% manganese doped titania. (see D3, example 3, page 5, line 21 to page 7, line 1).

The method of making said particles appears to be the same, therefore it is assumed, that the obtained particles will be the same as those of claim 1.

4.1. The subject-matter of claims 1-8 is not new in the sense of Art. 33(2) PCT.